

ABSTRACT

A semiconductor device and fabrication method thereof that uses a far ultraviolet ray photolithography, which may be used to prevent the lift phenomenon of a photoresist pattern, is disclosed. The semiconductor device may be fabricated by the process of: forming a film which is an object of forming a pattern on a structure of a semiconductor substrate; forming a anti-reflection layer on the film to form a stacking structure including the film and the anti-reflection layer; performing a plasma treatment to form grooves on a upper surface of the stacking structure; forming a photoresist pattern on the stacking structure on which the grooves are formed; and etching the stacking structure using the photoresist pattern as a mask to form a stacking structure pattern.